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ABSTRACT

The purpose of this guide is to assist specifiers in properly specifying carpet made of Monsanto Acrilan acrylic fiber. As carpet is used in an expanding range of applications, it must meet increasing and varying regulatory requirements. Performance needs vary with the type of environment in which the carpet is installed. Carpet construction must relate closely to specific fiber characteristics. And both quality installation and proper maintenance are essential to successful carpet performance. This guide provides the specifier with reference information and data and includes work sheets on which to develop a specification. Throughout the guide comments relative to the performance of Acrilan are indicated alongside performance descriptions. (Author/MLF)

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Monsanto

ACRILAN® Acrylic Fiber CONTRACT CARPET SPECIFICATION GUIDE

EA 008 781

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INTRODUCTION

The purpose of this guide is to assist specifiers in properly specifying carpet made of Monsanto Acrilan® acrylic fiber. As carpet is used in an expanding range of applications, it must meet increasing and varying regulatory requirements. Performance needs, for example, vary with the type of environment in which the carpet is installed. Carpet construction, too, must relate closely to specific fiber characteristics. And both quality installation and proper maintenance are essential to successful carpet performance.

This guide provides the new specifier with reference information and data, and includes work sheets on which to develop a specification. The experienced specifier may wish to turn immediately to the work sheets (inserted inside the back cover) and refer only to those sections concerned with specific product application.

One of today's fastest growing markets is the complex field of commercial and institutional interiors. The choice of carpeting for these interiors remains one of the most critical decisions for a specifier. Conflicting information can often complicate a decision.

Carpet specifications, therefore, are sometimes incomplete or inaccurate.

There are many inter-dependent factors that go into the construction of a carpet, and each factor must be separately assessed before a specification can be made. Each specific area in a building will have different requirements, different emphasis. It is essential that comprehensive details be provided to the mills on just what is expected of the carpet.

This guide covers both Acrilan® acrylic fiber, (Acrilan® Plus carpets), and Solution-dyed Acrilan acrylic fiber, (Acrilan® 2000+ carpets).

The solution-dyed fiber is colored when the fiber is in its liquid state. Standard Acrilan fiber is produced as white fiber then dyed using stock or yarn dyeing techniques. Solution-dyed Acrilan is used in carpets where maximum fade resistance and maximum resistance to harsh chemicals or staining is required. Acrilan 2000+ carpets using solution-dyed Acrilan are particularly static resistant.

Both fiber types offer a high degree of styling flexibility and appearance retention characteristics.

Throughout this guide comments relative to the performance of Acrilan are indicated alongside performance descriptions.

REGULATORY REQUIREMENTS

When selecting carpet for most commercial and institutional installations, a major concern is, of course, the various governmental regulations that apply to a specifier's particular installation.

There are several strict federal standards regarding flammability and other performance certification requirements that must be met for carpeting to be used in hospitals, schools, hotels, dormitories, and certain residential developments.

These standards are set and enforced by agencies ranging from the Department of Commerce to the U. S. Public Health Service. In addition, there may be even more stringent requirements established by state or local authorities, or by a client or institution. Testing procedures and acceptable ratings can vary depending on the purpose the carpet is to serve and on the jurisdiction of the originating agency.

Fiber type alone does not assure compliance with regulatory requirements. Other factors, such as pile height and density, type of latex and type of backing in combination, play crucial roles. It's a fact that Acrilan® acrylic fiber is being used in carpet constructions that meet or exceed most regulatory requirements.

FLAMMABILITY TESTING

Although the general implication of flammability connotes the degree of ease of ignition or rapidity of burning, in actual practice flammability carries a meaning only with respect to performance of a product subjected to a specified test. When determining flammability of carpet, any of a number of tests may be designated.

Methenamine Tablet Test—U.S. Department of Commerce DOC FF 1-70 or ASTM Standard D-2859-70T

This test determines the resistance to ignition and the surface flammability of carpets when exposed to a small standard source of ignition (a timed, burning methenamine tablet) in a draft-protected (free) environment. If carpet specimen burns three inches in any direction, it fails the test.

Steiner Tunnel Test—Public Health Service & Life Safety Code Standard ASTM E-84-70

This test subjects carpet specimens to a heavy flame source and uses flammability spread as a comparative measure. Carpet samples 25 feet long by 1 ft. 8 in. wide, mounted *pile down* on the ceiling of a test tunnel, are subjected to heat and flame in a temperature range of 1600° to 1800°F (871°C to 982°C), under standard draft conditions. Test duration is 10 minutes or until sample has burned out completely, whichever is first. Progress of flame along length of test sample is observed every 15 seconds and the greatest distance of flame-spread is then used to calculate flame-spread rating. A flame-spread rating of 75 or less is necessary for floor coverings used in hospitals which receive funds through the Hill-Burton Act. Other flame-spread classifications defined by the NFPA Life Safety Codes are:

0-25	CLASS A
26-75	CLASS B
76-200	CLASS C
201-500	CLASS D

Measures of smoke density are also taken during burning test. A smoke density rating of 200 has been used in several specifications, although a national standard has not been set.

NOTE: CLASSES A TO D PERTAIN TO FLAMMABILITY RATINGS ONLY AND DO NOT RELATE TO SMOKE DENSITY.

NBS Smoke Chamber Test Appendix II—NBS Technical Note 708

While this test is not currently a required federal regulatory test, it is often used by some agencies to check smoke evaluation. It measures the smoke obscuration of a vertically mounted specimen approximately 2½ inches square that is exposed to radiant heat (non-flaming condition) or radiant heat in combination with pilot flamelets (flaming condition). Flaming and non-flaming results are then averaged. This test often supplants the smoke density test under ASTM E-84 and is being used by HEW for Hill-Burton funded facilities. An average of 450 maximum is an accepted standard for the flaming and non-flaming results.

Radiant Panel Flooring Flammability Test

(Proposed federal regulatory test.) This test is being developed for possible replacement of E-84 Steiner Tunnel Test and the UL992 Chamber Test. Reportedly superior to both these tests, it measures flame-spread of carpets exposed to extended Radiant energy. Samples are tested in the normal end-use configuration.

Carpet specimen is exposed to a radiant heat flux that decreases along the length of the specimen. The specimen is ignited at the highest heat flux end and allowed to burn until it will not support flaming combustion. The radiant heat flux at the point the flame extinguishes is recorded as critical heat flux. The heat flux is expressed in watts/cm^2 Pass-fail heat flux level of 0.5 watts/cm^2 or higher is recommended for corridors and exit ways in hospitals and other institutions; 0.25 watts/cm^2 is recommended* for corridors and exit ways in other buildings.

Floor Chamber Test UL Subject 992

(While this is not currently a required federal regulatory test, it has been proposed by HEW that it be accepted as an alternative test method of E-84.) This test uses flame-propagation as its measure. Sample is placed on floor and subjected to a flame under a draft for 12 minutes, after which the burner is shut off and the flame is allowed to propagate an additional 12 minutes. A Flame Propagation Index limit of four or less (corresponds to 26-75 range of Steiner Tunnel Test) has been set in several specifications. The Index rating is reported in whole numbers between 0-25.

PERFORMANCE CERTIFICATION

In an attempt to improve performance characteristics directly related to construction elements of carpeting, the following federal regulation has been established.

UM44C—HUD-Funded Projects Only

Sets forth standards for carpet and carpet certification program for residential structures and nursing and elderly homes under the jurisdiction of the Department of Housing and Urban Development and the Federal Housing Administration.

*The National Bureau of Standards has proposed the Flooring Radiant Panel test be used for non-sprinkled corridors and primary exit ways. The methenamine pill test would be used for room carpet and sprinkled corridors. At this writing the recommendation has not yet been accepted.

ACRILAN® PERFORMANCE

Monsanto has improved the flame-retardant qualities of Acrilan acrylic fiber to the degree that carpets of 100% Acrilan acrylic, when properly constructed, pass the most exacting federal flammability tests. Carpets made of Acrilan acrylic fiber show virtually no tendency to propagate a flame in the Methenamine Tablet Test. In the Steiner Tunnel Test, appropriate carpet fabrics, made of Acrilan acrylic consistently achieve a flame-spread rate well below 75, therefore qualifying for use in hospitals receiving funds through federal agencies. Several fabrics constructed of Acrilan acrylic have achieved Class A ratings with one fabric receiving a rating of five (5). A smoke density rating as low as 25 has been achieved with carpet made of Acrilan acrylic fiber as well. Although the Radiant panel test had not been set as a performance standard, carpets of Acrilan acrylic fiber meet or exceed current test conditions.

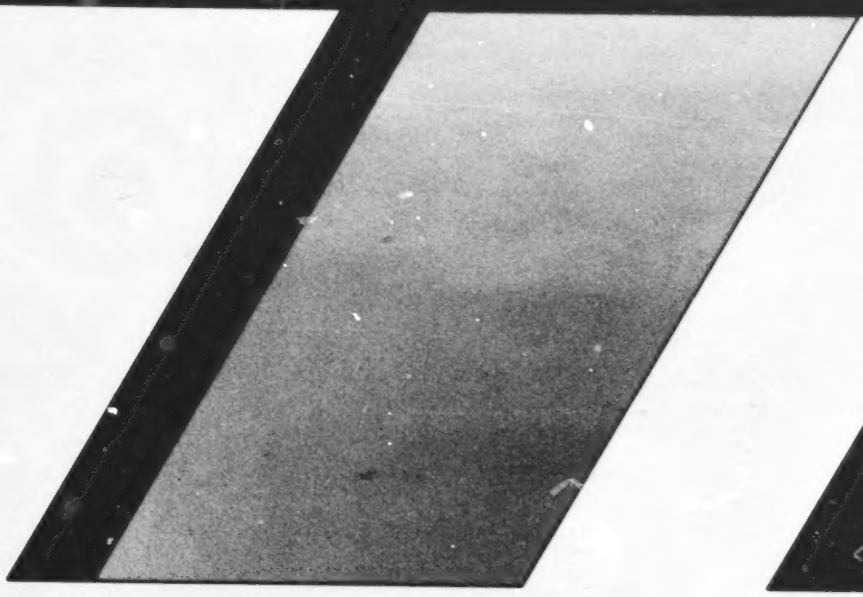
Compliance with standards set forth by UM44C is determined by carpet manufacturing practices. There are numerous carpets made of Acrilan acrylic fiber available that meet or exceed UM44C.

II

PERFORMANCE CHARACTERISTICS

DURABILITY

The definition of durability is the ability to last. Abrasion resistance is cited by most fiber manufacturers as the determining factor of this ability. But Monsanto feels appearance retention, the ability of carpet to look good as long as it lasts, is also a major factor. To retain its appearance, a carpet must also be resilient, easy to maintain, and have a good measure of color retention. All these factors working together will determine carpet surface appearance.



Abrasion Resistance

The ability of carpet to withstand abrasion from heavy traffic without losing pile weight.

Acrilan® Performance

Very good abrasion resistance when used in proper construction (refer to Construction Guidelines in Section IV).

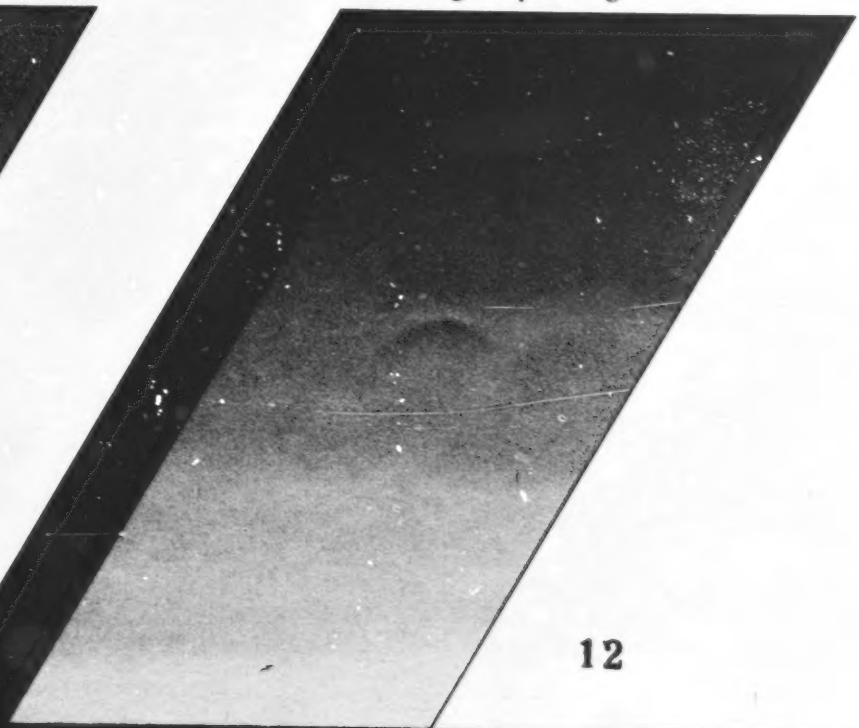
Resilience

A carpet's ability to retain its original appearance by recovering after periods of crushing from furniture or heavy traffic. High degree of resilience will keep carpet from developing traffic lanes.

Acrilan Performance

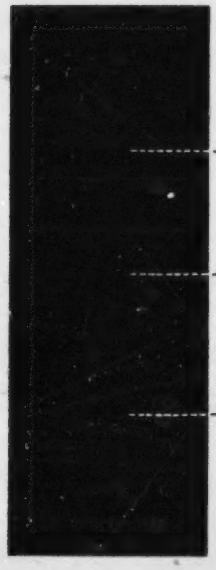
Highly resilient. A 50 PSI load was applied for 24 hours to a piece of carpet made of Acrilan acrylic fiber. It required only 24 hours for the carpet to recover a full 90% of its original pile height.

In another test, after exposure to a traffic load of 128,000 people, carpeting made of Acrilan fiber retained approximately 94% of its original pile height.



Maintainability

Initially, this is the ability of carpet to resist soiling and staining. Ultimately, it is the ability of the carpet to be restored to its near original appearance after having been in use in a given location.


Cleaned with shampoo, touched up with bleach and absorbent materials.
Cleaned with carpet shampoo.
Soiled with crayon.
Acrilan® 2000 + carpet with man-made backing before soiling.

Acrilan® Performance

Carpets made of Acrilan acrylic fiber are easily restored to their near original appearance even after considerable periods of use. Acrilan acrylic fiber has a relatively smooth, hard surface so dirt doesn't tend to adhere to it. The fiber also resists moisture absorption, so spills tend to remain on the fiber surface. Low static build-up inhibits the attraction of airborne dirt particles. Also, because the fiber is opaque or translucent, depending upon the type, soiling that does occur is partially hidden. Once soiled, carpets made of Acrilan acrylic fiber can be restored quickly and easily with conventional cleaning methods.

Acrilan® 2000+ carpets are the most cleanable carpets known. They are made of a solution-dyed fiber. Powerful cleaning agents can be used to remove spots and stains with no danger of color damage. Even 100% household bleach can be used as a cleaning agent on Acrilan 2000+ carpets if they are backed with a man-made backing.

Tuft Bind (ASTM D1335)

A measure of how well the individual tufts are held in the structure of a carpet. The force required to pull this tuft out of the face of the carpet is determined.

Acrilan Performance

Tuft bind is obtained by proper application of the back coating. Acrilan fabrics meet or exceed requirements. A single tuft should withstand a minimum of 6-8 pounds of force for most end use applications. Monsanto recommends a higher tuft bind when the possibility of deliberate ravelling exist such as in grade school installations.

Color Retention

The ability of carpet to retain as close to its original color as possible despite exposure to strong light, harsh cleaning solvents, atmospheric conditions, and the abrasive action of traffic.

Below are several tests used to determine color retention of carpeting. Results of these tests are evaluated against an International Gray Scale rating as follows:

5—NO CHANGE

4—SLIGHT CHANGE

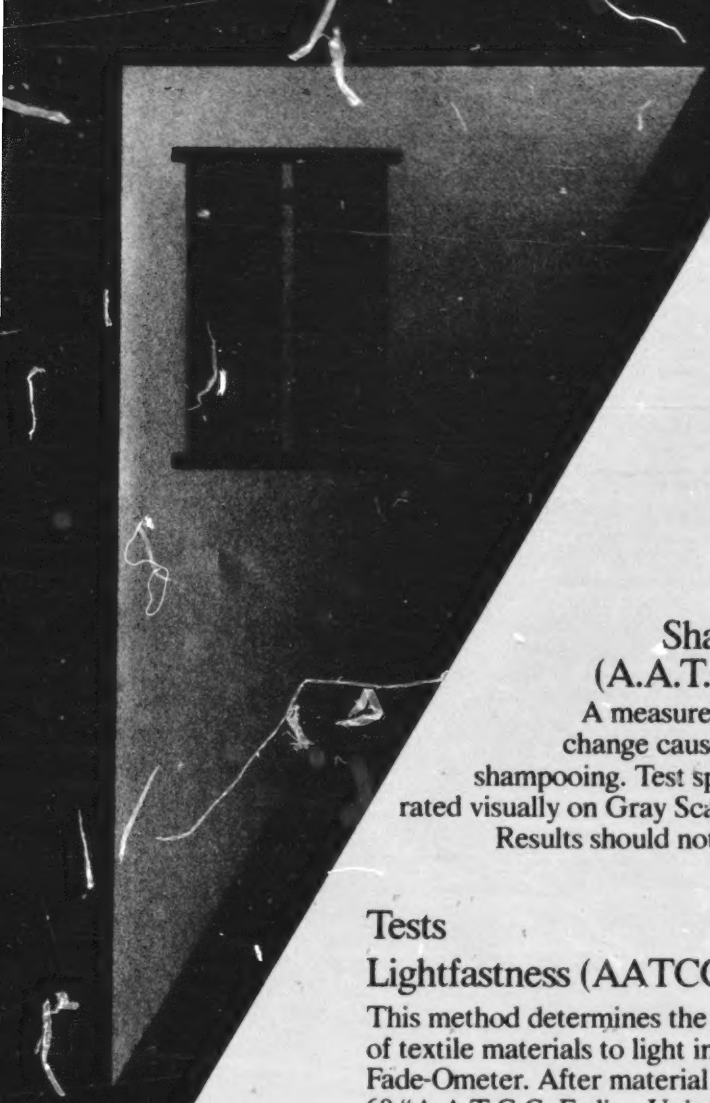
3—NOTICEABLE CHANGE

2—CONSIDERABLE CHANGE

1—MUCH CHANGE

Acrilan Performance

Carpets made of Acrilan acrylic fiber equal or surpass other generic fiber types in color retention. Acrilan® 2000+ carpets are the most colorfast known. In most colors, Acrilan 2000+ carpets have withstood 2000 A.A.T.C.C. Fading Units of sun exposure with no visible fading compared to the industry average of 40 to 80 A.A.T.C.C. Fading Units. Acrilan acrylic carpet fiber is superior to other generic fiber types in resisting ozone and gas fading. Carpets made of Acrilan acrylic are the least affected by harsh cleaning solvents with Acrilan 2000+ carpets being able to withstand 100% household bleach. Also, the abrasive action of traffic least affects the color of Acrilan 2000+ carpets.



Shampooing (A.A.T.C.C. 138)

A measure of the color change caused by severe shampooing. Test specimens are rated visually on Gray Scale Standard. Results should not be below 4.

Tests

Lightfastness (AATCC-16E)

This method determines the colorfastness of textile materials to light in a xenon arc Fade-Ometer. After material is exposed to 60 "A.A.T.C.C. Fading Units" and judged visually for change, a Gray Scale rating of at least 4 is desired.

Atmospheric Fading (AATCC 129)

This test determines the color change of the carpet when exposed to Ozone gas in the atmosphere under high humidities. A shade change rating of above 3 after 3 cycles exposure is desired.

Crocking (AATCC 8)

This test determines the degree of color transfer from the carpet to a white cloth that is rubbed across the face of the carpet in a standard fashion. After 20 friction cycles, the color transference is rated visually on International Gray Scale Standard. Results should be 4 or above.

AATCC – AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS.

Acrilan® Performance

Acrilan Plus carpets rate a 4 or better when evaluated for color fading and crocking. Wet fastness properties of Acrilan are excellent. It will show no change after wet-method cleaning. Acrilan acrylic is not as open in physical structure as other fibers, thus ozone gas cannot penetrate as readily to induce color fade. This makes Acrilan acrylic fiber superior to other generic fiber types in resisting ozone and gas fading.

Acrilan solution dyed acrylic is produced with the color added into the polymer before the fiber is extruded. The color is thus a permanent part of the fiber and cannot be removed by cleaning solutions.

STATIC RESISTANCE

This is the ability of carpet to suppress the build-up of static electricity below the level where shock is produced, 2.5 to 3.5 KV. Factors of build-up include fiber, temperature, humidity, carpet backing, pile height, and pile density. In areas such as hospitals where delicate cardiac monitoring equipment is in use and where an excess of oxygen may be present in the atmosphere, or in offices where computers are installed...the presence of static in the carpet could create significant problems.

I. F. Walker Method— AATCC 134

This test induces and measures static build-up on carpets by simulating use conditions under which static electricity may become objectionable. Peak charge generation (at 70F and 20% relative humidity) developed by walking or shuffling traffic, is monitored under carefully regulated conditions and related to the threshold range of charge above which objectionable shocks may be experienced.

ACOUSTICAL CONTROL

All carpeting to a certain degree serves as an acoustical floor covering. It practically eliminates floor-impact noise and depending on construction and underlayment, it can absorb 50% or more of airborne noise producing an overall "hush."

Airborne-Sound Absorption NRC ASTM C 423

This test measures the ability of a material to absorb airborne noise that exists in a room. A sound-absorption coefficient indicates the fraction of impinging noise absorbed by the material. A rating of 1.00 means that the material absorbed all of the impinging airborne noise. Airborne-sound absorption is measured at six frequencies, rounding to the nearest 0.05 unit.

Acrilan® Performance

Acrilan 2000+ carpets (made with solution-dyed Acrilan) has the lowest propensity for static electricity build-up of all unmodified man-made or natural carpet fibers.

So low is the static build-up of Acrilan acrylic fiber that a leading computer company has adopted a special carpet system which utilizes Acrilan face fibers. This represents the first time that this company has ever recommended a single carpet for use in computer areas.

Acrilan Performance

Tested under this method, Acrilan 2000+ carpets produce a charge well below the threshold of sensitivity, 2.5 to 3.5 KV. Acrilan Plus carpets perform well under normal humidity situations.

Acrilan Performance

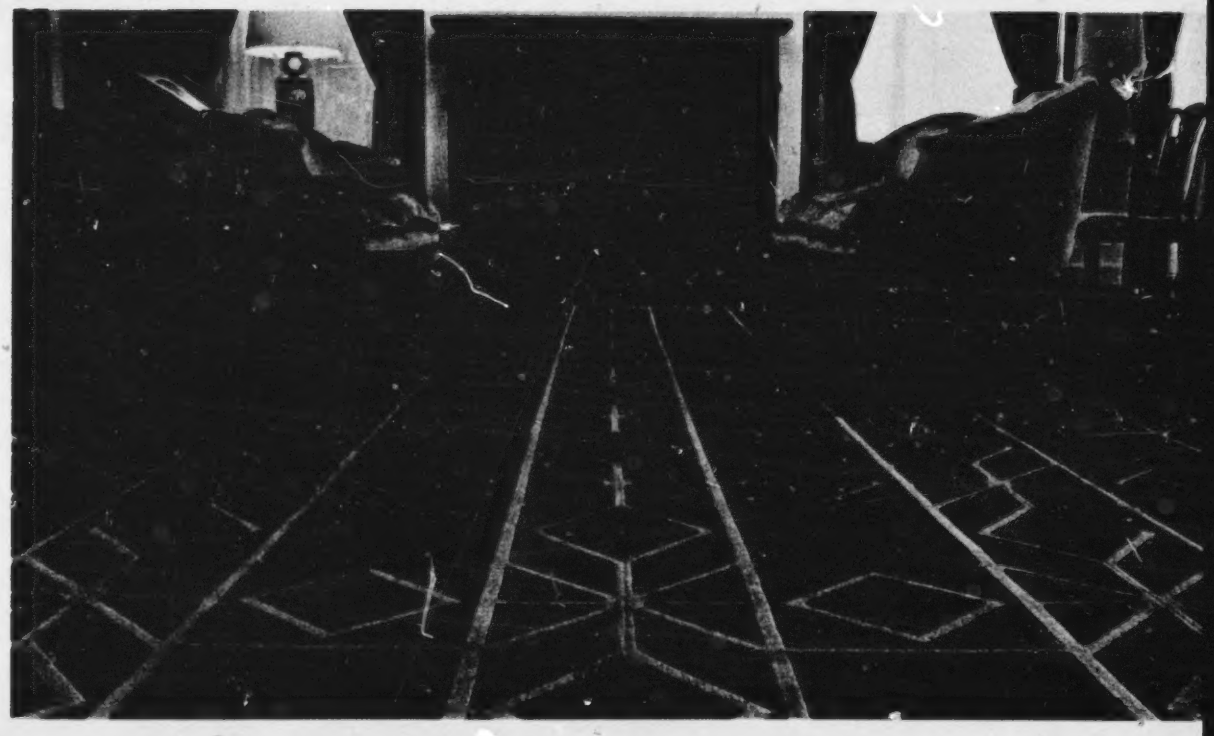
Carpets made of Acrilan acrylic fiber can substantially reduce noise levels, despite heavy traffic, because of their excellent resilience. Acceptable NRC Ratings would be .35 without padding and up to .50 or more with padding.

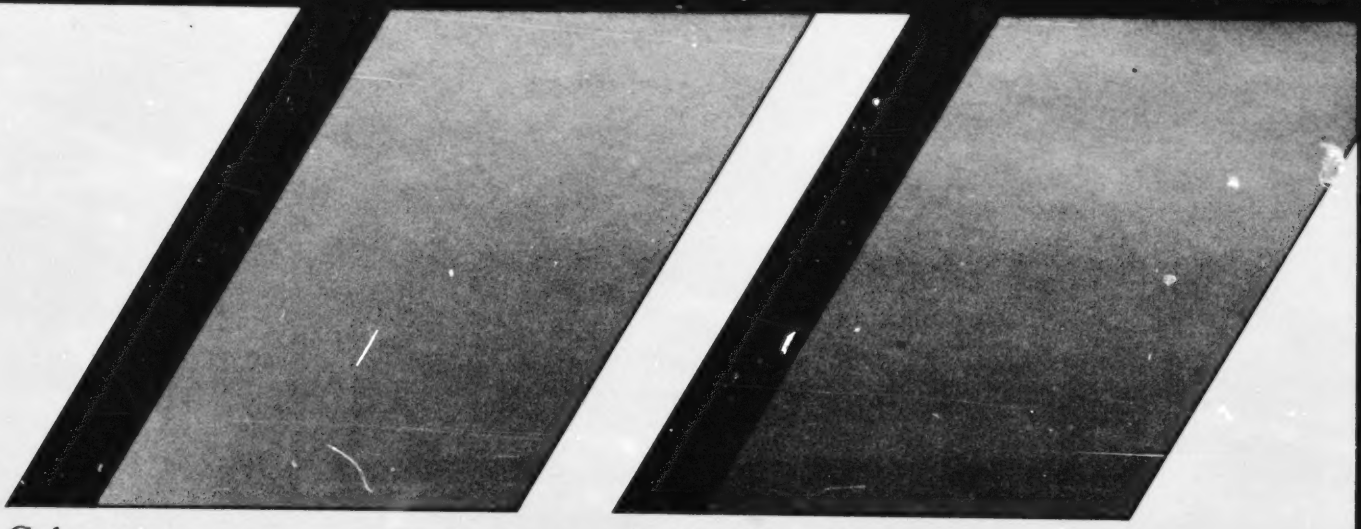
ASTM—AMERICAN SOCIETY FOR TESTING AND MATERIALS.

II

AESTHETICS

Aesthetic features of carpeting have a psychological impact. They can give hospitals a more recuperative atmosphere. They can give schools an environment that's more conducive to learning and give offices an atmosphere that's more conducive to work. Aesthetics can also have other practical performance benefits as well.





Color

Your color specification may be determined by function of area to be carpeted, by traffic, by the need to create a mood or atmosphere, by the color of the soil in your locality, or by a combination of all these factors. In general, lighter colors will soil more rapidly and will require more frequent cleaning. This should be considered when planning colors for heavy traffic areas.

Texture

Texture can be achieved by varying pile height, by a combination of cut and uncut tufts and by yarn size and construction. There is a tendency for highly textured fabrics to mat or show traffic lanes and, therefore, these fabrics should be avoided in high-traffic areas.

Design

Design is a combination of fabric pattern, color, texture, and style of construction.

Acrilan® Performance

Acrilan acrylic adapts readily to all modern dyeing techniques. It may be stock-dyed, skein-dyed or continuously dyed (Küster) in a full range of shades. The uniform whiteness of Acrilan acrylic gives superb color clarity and fidelity. You can get precisely the shade you need at any point of the color spectrum.

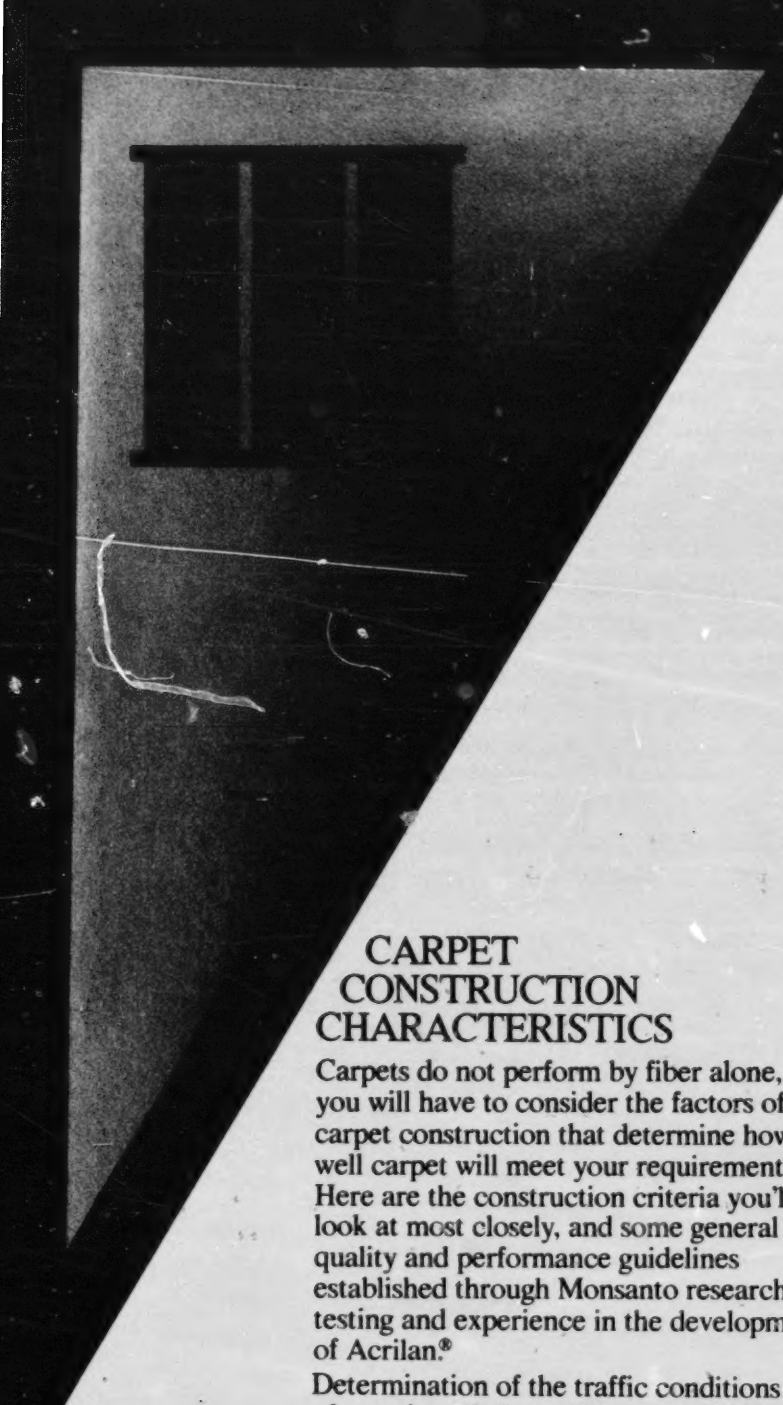
Monsanto solution dyed Acrilan, the only solution dyed acrylic fiber, is available in a range of appropriate styling colors.

Acrilan Performance

Wool has always been the industry standard for carpeting texture. In every way, Acrilan equals or surpasses the textural qualities of this natural fiber.

Acrilan Performance

Carpets made with Acrilan acrylic fiber can be tufted, woven, fusion bonded, or knitted in an endless variety of designs and styles. Dramatic or understated, contemporary or classic, utilitarian or luxurious. This versatility enables you to use carpeting to define work areas or to highlight areas to which you want attention drawn. Acrilan acrylic has application in all types of construction and is being used in many innovative installations.



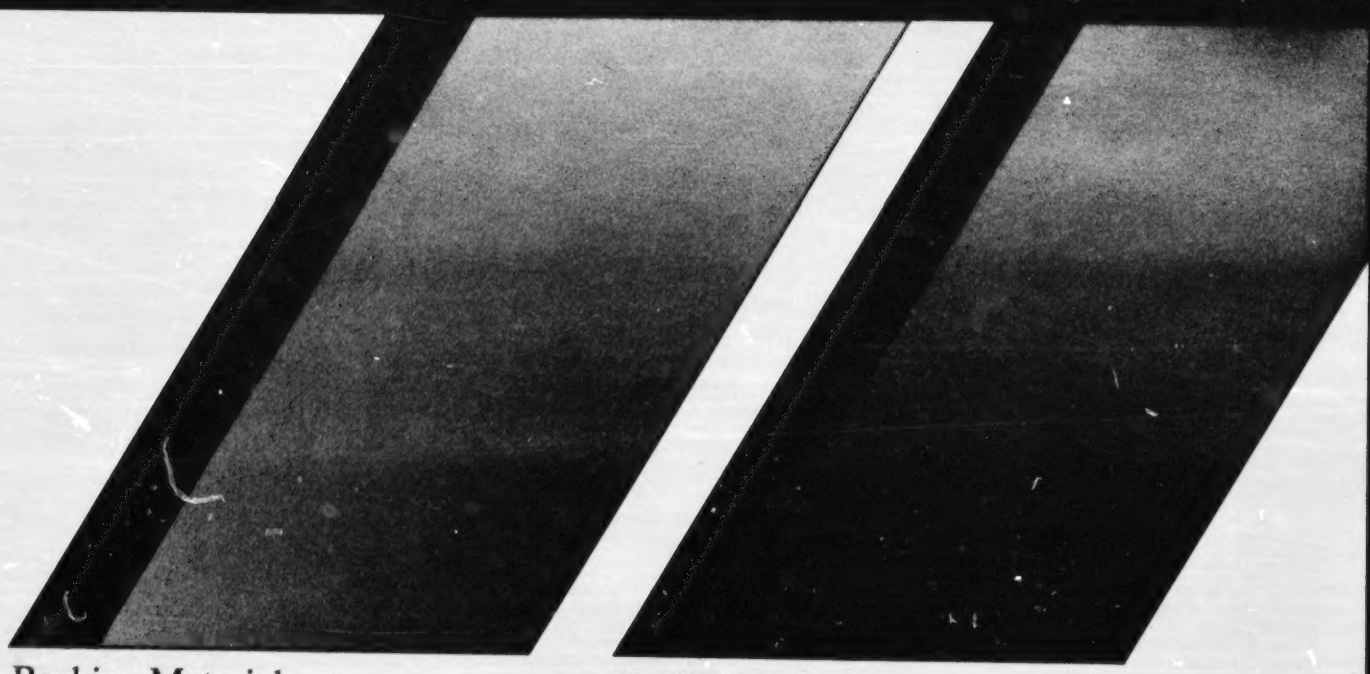
CARPET CONSTRUCTION CHARACTERISTICS

Carpets do not perform by fiber alone, so you will have to consider the factors of carpet construction that determine how well carpet will meet your requirements. Here are the construction criteria you'll look at most closely, and some general quality and performance guidelines established through Monsanto research, testing and experience in the development of Acrilan.®

Determination of the traffic conditions of your installation will be most helpful in developing specification criteria. Traffic level generally can be categorized as light/medium or heavy for commercial installation. The traffic class chart in Section IV indicates a general breakdown of areas to be carpeted along with traffic class. L-M-light to medium traffic, H-heavy traffic.

Acrilan Performance

Acrilan acrylic fiber can be woven, tufted, knitted or fusion bonded into a variety of carpet constructions. Acrilan's ability to meet the requirements for your installation is governed by your selection of face weight, pile height and texture expressed as a "density" factor.



Backing Materials

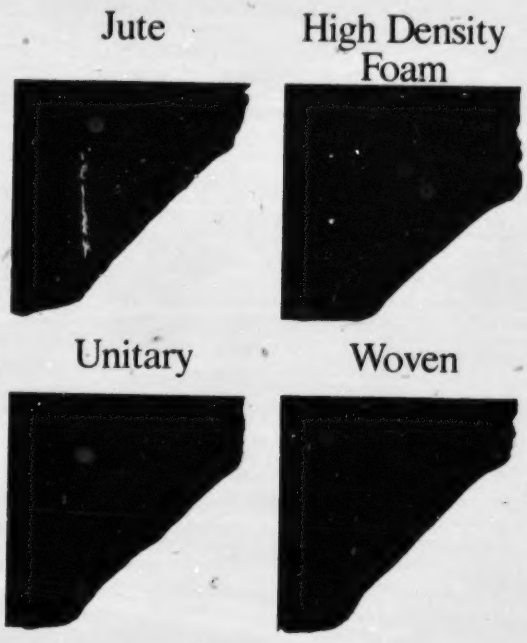
Several primary backings are available depending on the use. These may be woven of jute or polypropylene, or non-woven of a variety of material or synthetic fibers. Synthetic-backed carpet is normally used outdoors or on recreational areas or where there is moisture.

In woven and knitted carpet, backing yarns and pile yarns are woven or knitted together as the carpet is being made. Fibers used can be jute, kraftcord, polyester, polypropylene, cotton, rayon or any combination of these.

To ensure tuft bind and inhibit pile yarn from pulling out, a back coating (usually a latex compound), is applied to the back. The back coating also adds body or hand and an added measure of dimensional stability. This is referred to as a unitary backing system. In most carpet constructions, a secondary backing is adhered to the carpet to provide additional strength, stability and body. Secondary backing includes high density foam cushions, synthetic thermoplastics, jute and various permeable materials.

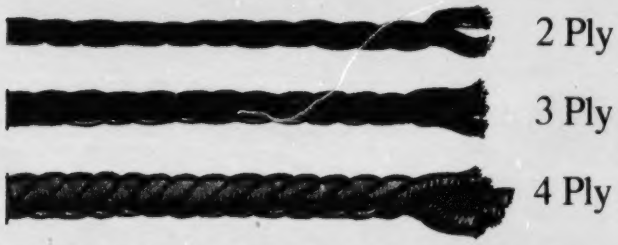
Acrilan Performance

Carpets made of Acrilan acrylic are available with a wide variety of primary and secondary backings. A specifier has a choice when tailoring the carpet to meet particular installation requirements.



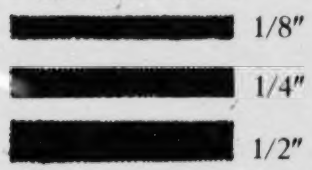
FIBER & YARNS

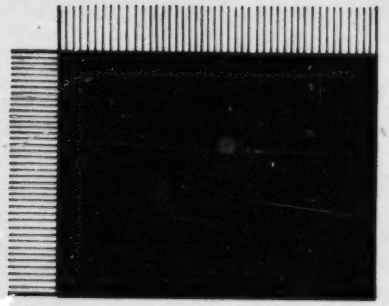
MAGNIFICATION



ELEMENTS OF CONSTRUCTION

PILE HEIGHT

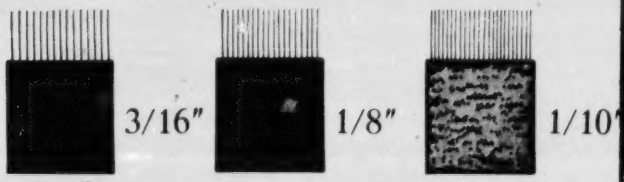




EXAMPLE:
216 Pitch (woven) or 1/8 gauge (Tufts)
X 8 rows (woven) or 8 stitches (Tufts)
= 64 Tufts per square inch

GAUGE

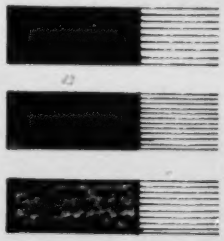
The distance between two needle points expressed in fractions of an inch.

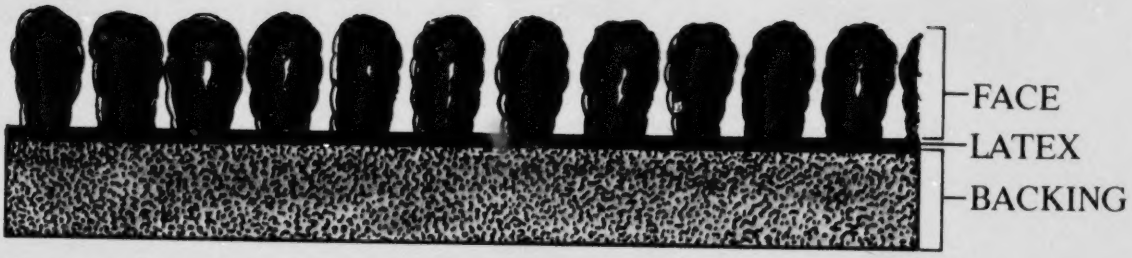


Gauge/Pitch – The number of ends of surface yarn counting across the width of carpet. In woven carpet, pitch is the number of ends of yarn in 27 inches of width, e.g. 216 divided by 27 = 8 ends per inch. In tufted carpet, gauge also means the number of ends of surface yarn per inch counting across the carpet. e.g. 1/8 gauge = 8 ends per inch. **To convert gauge to pitch,** multiply ends per inch by 27. e.g. 1/10 gauge is equivalent to 270 pitch or 10 ends per inch by 27. 1/8 gauge is 8 ends of yarn per inch by 27 = 216 pitch.

STITCHES

The number of lengthwise yarn tufts in one inch of carpet.





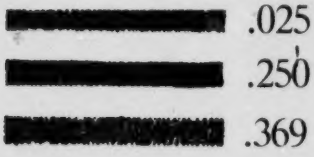
WEIGHT

Face weight + Latex + Backing = Total Weight.

$$\text{FHA DENSITY} = \frac{\text{Pile Yarn Weight} \times 36}{\text{Average Pile Height}}$$

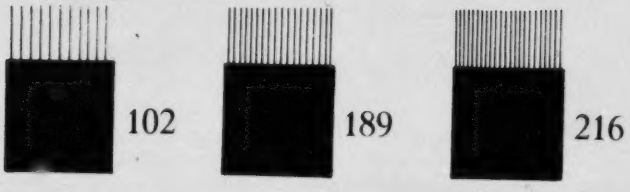
Weight Density = FHA Density × Pile Yarn

WIRE HEIGHT



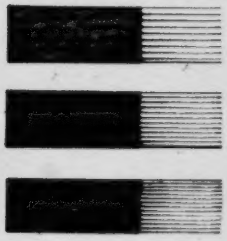
PITCH

The number of single ends per 27 inches of width.

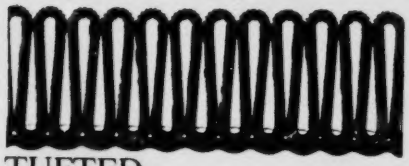


ROWS

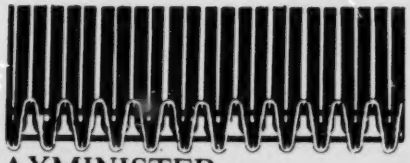
The number of lengthwise yarn tufts in one inch of carpet.



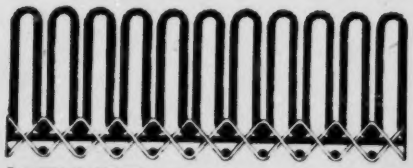
MANUFACTURING METHODS



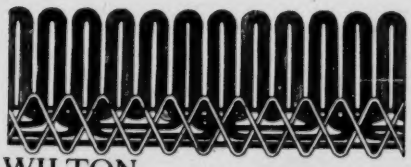
TUFTED



AXMINISTER

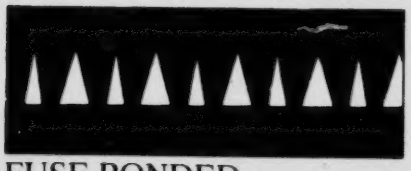


VELVET



WILTON

KNITTED



FUSE-BONDED

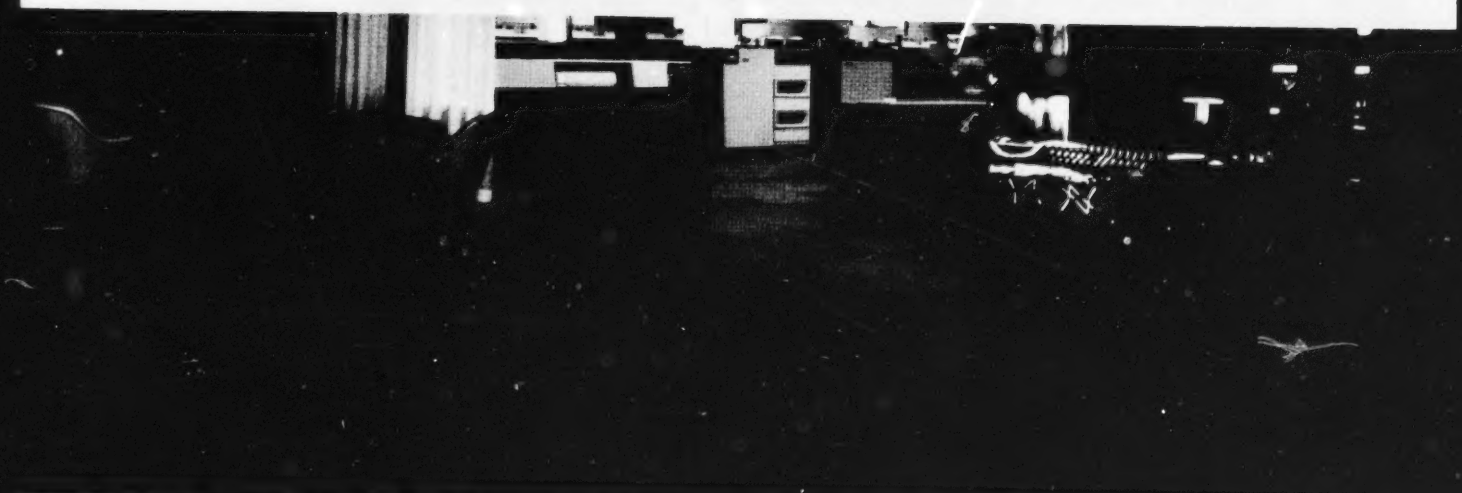
GENERAL SPECIFICATION GUIDELINES, INFORMATION

A specification should be written based on total performance and not construction. Construction may differ somewhat from manufacturer to manufacturer, i.e. gauge or pitch, stitches, pile height, etc. When the specification is based on performance criteria, competing manufacturers have the flexibility of submitting a fabric that will render the desired end-use characteristic.

Probably the most important aspect relating to total performace is "density." Basically, density is a measure of the weight per unit volume of the face fiber in a carpet. By definition, it can be seen that this takes into consideration the height of the pile above the carpet backing, as well as the weight of the yarn in a square yard of this face pile.

Obviously the denser the pile the less weight each tuft of yarn must support. Therefore, carpets of denser pile generally give greater resistance to crushing and longer wear.

Typical end-use application performance specifications are listed on the opposite page.



OFFICE

FACE WT.	34-36 oz.
PILE HT.	.187-.281
STITCHES IN.	7-10
DENSITY	4355 minimum
WT. DENSITY	148,070 minimum
TRAFFIC CLASS	Light-Medium
OTHER	Use chair pads under chair with roll casters.

COMPUTER ROOM

FACE WT.	40-42 oz.
PILE HT.	.187-.218
STITCHES IN.	9-12
DENSITY	6005 minimum
WT. DENSITY	264,200 minimum
TRAFFIC CLASS	Heavy
OTHER	Solution dyed fiber maximum static control.

HOTEL/MOTEL

FACE WT.	40-48 oz.
PILE HT.	.250-.296
STITCHES IN.	8.5-11
DENSITY	5760 minimum
WT. DENSITY	230,400 minimum
TRAFFIC CLASS	Heavy
OTHER	Patterned fabric for maximum aesthetics.

HEALTH CARE

FACE WT.	40-48 oz.
PILE HT.	.187-.250
STITCHES IN.	9-12
DENSITY	5760 minimum
WT. DENSITY	230,400 minimum
TRAFFIC CLASS	Heavy
OTHER	Solution dyed fibers for maximum static control and stain removal.

RESTAURANT

FACE WT.	38-42 oz.
PILE HT.	.218-.250
STITCHES IN.	8-12
DENSITY	6275 Min.
WT. DENSITY	238,450 minimum
TRAFFIC CLASS	Heavy
OTHER	Solution dyed fiber for maximum soil removal.

SCHOOL

FACE WT.	42-48 oz.
PILE HT.	.187-.250
STITCHES IN.	8-12
DENSITY	6048 minimum
WT. DENSITY	254,016 minimum
TRAFFIC CLASS	Heavy
OTHER	Tuft Bind - use higher rating than 6 to 8 lbs.

Acrilan® acrylic has the ability to allow open specifications that are restrictive with respect to those qualities desired, and at the same time totally open for manufacturing differences which can be stringently enforced.

Construction comparisons listed below are typical minimum examples when considering traffic conditions.

	Light-Medium (L-M)	Heavy (H)
Gauge (Tufted Carpets)	5/32, 1/8, 1/10, 5/64	1/8, 1/10, 5/64
Pitch (Woven Carpets)	165, 216, 256-370	216, 256-270
Stitches (Tufted) Minimum	7	8 or above
Rows or Wires (Woven) minimum	7	8 or above
Pile Height	.156 to .370"	.187 to .437"
Face Yarn Weight	28 oz. to 40 oz.	40 oz. and above
Construction	Level Loop, Cut/Uncut	Level Loop, Multi Level Loop, cut pile
Av. Density $\frac{(36 \times \text{Yarn Wt.})}{(\text{Pile Height})}$	3377 Minimum	5760
Wt. Density = Av. Density $\times$ Yarn Wt. / (Pile Height)	144,000 Minimum	230,000

(L-M) denotes Light-Medium traffic
(H) denotes heavy traffic

Carpeted Areas	Traffic Rating
EDUCATIONAL†	
1. Schools & Colleges	
a. administration	L-M**
b. classroom	H
c. dormitory	H
d. corridor	H*
e. cafeteria	H
f. libraries	L-M**
2. Museums & Art Galleries	
a. display room	H
b. executive	L-M**
c. lobby	H
MEDICAL†	
1. Health Care	
a. executive	L-M**
b. patients room	H
c. lounge	H
d. nurses station	H
e. corridor	H*
f. lobby	H
COMMERCIAL†	
1. Banks	
a. executive	L-M**
b. lobby	H
c. teller windows	H
d. corridors	H*
2. Retail Establishments	
a. aisle	H*
b. check-out	H
c. sales counter	H
d. smaller boutiques, etc.	H
e. window & display area	L-M
3. Office Buildings	
a. executive	L-M**
b. clerical	H**
c. corridor	H*
d. cafeteria	H
4. Supermarkets	H
5. Food Services	H

Carpeted Areas	Traffic Rating
RECREATIONAL†	
1. Recreation Areas	H
a. club house	H
b. locker room	H
c. swimming pool	H
d. recreational vehicles	H
e. boats	H
2. Theaters & Stadiums (Indoors)	H
3. Convention Centers	
a. auditorium	H
b. corridor	H*
c. lobby	H
TRANSPORTATION†	
1. Terminals	
a. corridor	H*
b. administration	L-M
c. ticket counter	H
MULTI-RESIDENTIAL†	
1. Apartments, Hotels & Motels	
a. lobby/public areas	H*
b. corridors	H
c. rooms	L-M
RELIGIOUS†	
1. Churches/Temples	
a. worship area	L-M
b. meeting room	H
c. lobby	H

**Chair pads are recommended to be placed under office chairs with roll casters.

* If objects are to be rolled over an area of carpet, the carpet should be of maximum density to provide minimum resistance to rollers. For safety, select only level loop or low, level dense cut pile.

† Major Construction Categories.

Installation

The quality of installation is of major importance in determining the beauty and durability you can expect from contract carpet. You'll want to specify a reliable, proven installation procedure that meets the requirements of the area involved.

Reputable, competent installation professionals will use one of the following techniques:

Direct Glue-Down

This method is recommended for large areas where heavy, wheeled traffic is anticipated. You can significantly reduce seams and delamination problems. Also shrinkage problems frequently encountered are eliminated. The initial cost of conventional carpet is less because separate underlayment is unnecessary. In any direct glue-down, the most important factor of a successful installation is floor preparation. If this is properly done, the installation is permanent. No restretching is necessary.

Tackless

For large or heavy-traffic installation, flat dense pads should be used. Pads do impart added resiliency and resistance to pressure which enhance the luxurious feeling of carpet. Also, research studies conducted by a leading testing house, indicate a favorable effect of padding in reducing wear. Pile loss (actual abrasive loss of fiber rather than pile compression

alone) tests indicate that a carpet with no cushion loses about 12% as opposed to about 4% in the carpet with separate cushion. In tests conducted in sound laboratories, sound absorption and impact noise tests showed that carpets with separate cushion provided more effective acoustical insulation. The heat-transfer factor of a carpeted floor and separate cushion is about 1/3 of what it would be without any cushion. Carpets installed by the tackless method offer good resistance to crushing of pile and can be easily removed or replaced.

Special Needs/Requirements

In estimating and planning the installation, it is important to obtain all the basic facts needed by the estimator—dimensions and layout of rooms, unusual features, special problems—so that he can prepare the best installation plan on the most economical basis consistent with eye appeal and serviceability.

Scale drawings are important in any installation job. The drawings outline the locations of seams, which is one of the most important aspects of the art of carpet laying. Factors that influence location of seams are traffic, pile lay, economy in cutting/sewing and customer satisfaction.

In planning a carpet installation, direction of pile is important. The scale drawing will be helpful in keeping the pile direction uniform throughout the installation.

The three main methods of seaming are heat seams, sewn seams and latex seams. Regardless of seaming method used, all edges along seam must be sealed to prevent face yarn unravelling.

Acrilan® Performance

Padding or direct glue-down, with Acrilan acrylic—the choice is yours.
Carpeting of versatile Acrilan acrylic fiber can either be installed over padding or glued down directly. The choice depends on the size of the area to be carpeted and the attributes you expect from the carpeting. Both methods have specific advantages. A padded carpet installation offers superior sound control, resilience, and foot comfort. The direct glue down method is especially effective in open-space, team-teaching areas. This method means less shifting and buckling of the carpet so restretching is seldom necessary. It also reduces the possibility of seam splitting. The initial cost will usually be lower since padding purchase and padding installation are eliminated. With carpeting of Acrilan acrylic fiber, you not only have a choice of how to install it, but where to install it; in the classroom, chemistry lab, cafeteria, pool area, auditorium, library.

Maintenance

Proper maintenance is just as important to the life and appearance of carpet as fiber content, type of construction and method of installation. Proper and regular maintenance will, of course, keep carpet looking fresh and new, but more importantly it will also extend the life span of the carpet. And the longer the life of the carpet, the better the return on your client's initial investment.

Since maintenance is so important, it should be considered and planned for before the carpet is even installed. And the cost of maintenance, in terms of labor and equipment, should be considered as part of the total life cycle costing.

Scheduling

Just as your choice of fabric is based on the amount and type of traffic in a particular area, so is carpet maintenance in direct relation to the amount and type of traffic. Therefore, you can plan basic maintenance programs and schedules and purchase correct equipment during the specification period. Once the nature of the traffic has been determined, scheduling should be implemented and followed immediately upon installation of the carpet.

Acrilan® Performance

Monsanto has developed these rules-of-thumb for effective maintenance of Acrilan 2000+ carpets and Acrilan Plus carpets.

Vacuuming—High Traffic Areas-Daily
Medium Traffic Areas—Twice Weekly.
Low Traffic Areas—Weekly

Spot Cleaning—Daily as needed (and as soon after staining as possible).

Pile Lifting—Overall every week.

Wet Cleaning—When carpet looks dirty, or is no longer restored to original appearance by vacuuming. Light traffic areas will probably need cleaning only once a year. Heavy traffic areas may need it twice a year or more.

Equipment

Good carpet cleaning equipment is indispensible to an effective maintenance program. Certain types of equipment are necessary for initial use, others for regular on-going maintenance procedures. For effective costing, the price of this equipment and its upkeep should be included in your initial installation budget.

Types of Carpet Maintenance

Efficient vacuuming at established frequencies is necessary for any effective maintenance program. Vacuuming methods and frequencies are fairly standard, but desirable frequencies are more difficult to establish. They depend to a great extent on the general layout of your building, the type of business it houses, the color of carpeting, traffic load and the type of outside soil commonly brought in by traffic.

A separate spot cleaning program should be established, especially for areas where accidental spillage frequently runs at a higher rate. There are many excellent commercial spot removal kits on the market for the custodian to use—one kit is so simple it has a dial to select the type of spot and the recommended spot removal procedure. Spills should be attended to as soon as possible, and never left more than a day.

Area Maintenance

Where soiling is light, absorbent dry cleaning compound is often used. Where dry time is critical and soiling is light to medium, a dry foam system is suggested. Extraction cleaning units vary but do a very satisfactory job. Residuals are removed more completely reducing resoiling.

In general, a specifier should be thoroughly familiar with maintenance equipment and techniques for the particular carpet specified. Both preventative and regular maintenance procedures should be recommended. For information on specific carpet maintenance information, write: Monsanto Textiles Company, 320 Interstate North Parkway, Atlanta, Ga. 30339.

Acrilan® Performance

For initial use in Acrilan acrylic contract installations, you will need one or more big time-saving industrial, upright vacuum cleaners for open areas; several standard beater-bar upright cleaners for smaller areas. Also suggested: a pile lifter to loosen caked solids and restore crushed pile in high traffic areas, and to pre-condition carpet before wet or dry cleaning.

For later use you will want wet-cleaning equipment, and a powder-cleaning machine or an absorbent yarn pad to refresh heavily soiled areas between wet cleanings.

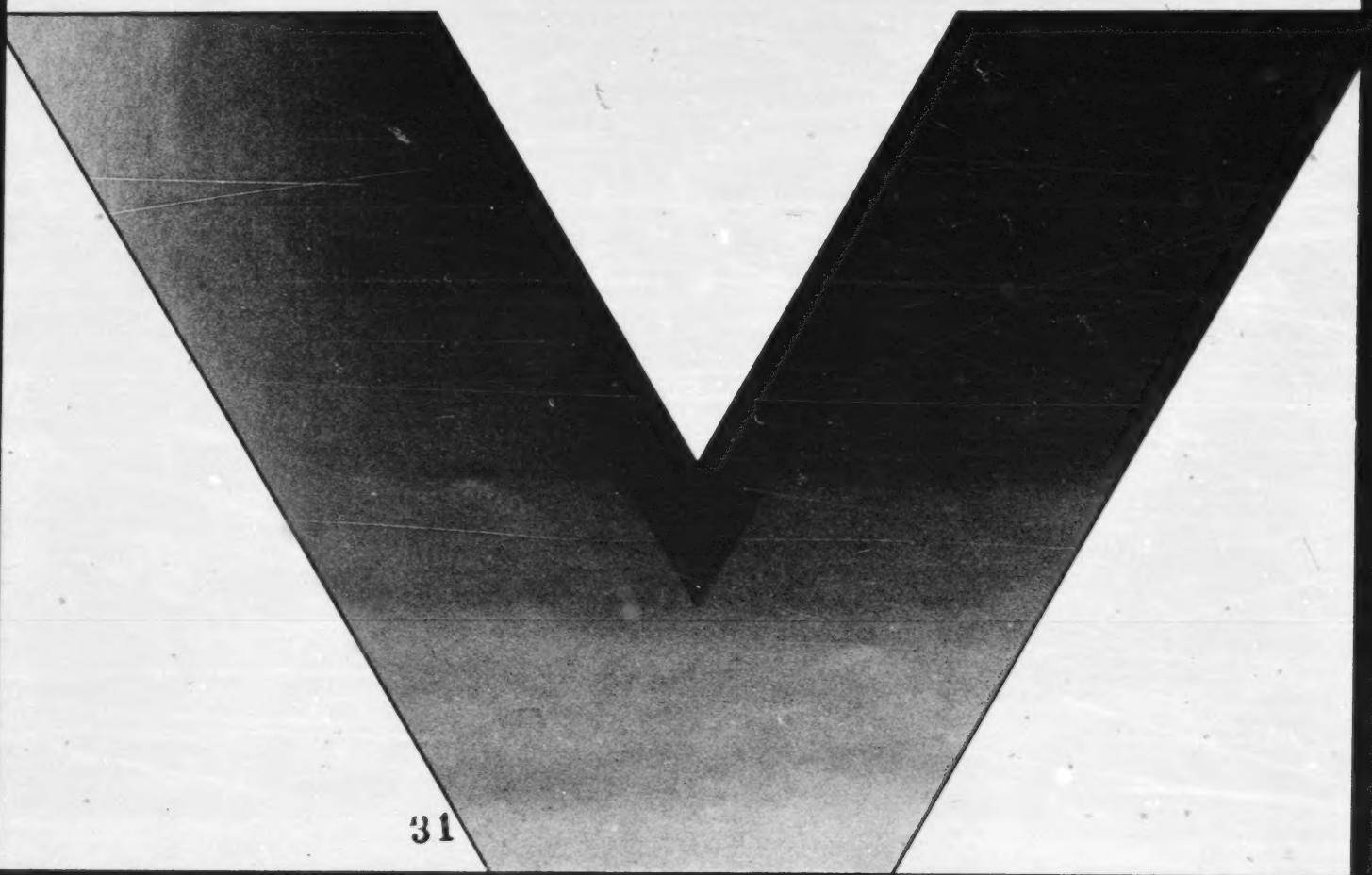
Acrilan Performance

Excellent response because of soil resistance, resiliency, low-static cling. Highly effective because of moisture resistance and, with Acrilan 2000+ carpets, high color fastness that allows use of powerful cleaning agents without harm.

Monsanto has a professional staff anxious to advise and counsel you about carpeting and carpet fibers—their selection and maintenance. Should you have any questions about contract carpeting or mill resources, please contact us: Monsanto Textiles Company, 320 Interstate North Parkway, Atlanta, Georgia 30339 (404) 434-4949.

Since the most effective carpet decisions are made when the manufacturer fully understands the project requirements, the problem for many specifiers would be partly solved if a vehicle existed whereby the relevant details could be communicated. One suggested vehicle proposed by Monsanto is completion of a "Space Analysis Work Sheet" as outlined at the end of this chapter.

Once the proper information has been given, then and only then can a carpet evaluation be made. Information provided by means of the questionnaire presents the parameters of possible problems and helps define the goals and constraints. With such background, the specifier can submit the proposed specification and the manufacturer, based on their respective resources and experience, can submit an optimum performing carpet product.



SPACE ANALYSIS WORK SHEET

General Information

1.0 Title of Building

1.1 When is the bid date?

1.1a When is the installation date?

1.1b When is the completion date?

1.2 Name and address of the architectural practice

1.3 Name of the person to be contacted

1.4 Title of areas to be carpeted

1.5 Description of activity within area

1.6 Area to be covered by carpet, in square feet

1.7 Budget for carpeting

1.7a Budget for underpadding

1.7b Budget for installation

Regulatory or Special Requirements

Section I

2.0 Relevant Fire Code

2.1 Flame Spread Requirement

2.2 Smoke Density Requirement

2.3 Hill Burton Funded

2.4 HUD Funded

Performance Characteristics

Section II

Durability

3.0 Traffic in area: Per hour, hours per day

3.1 Type of other traffic in area (wheeled, etc.)

3.2 Will furnishings be moved periodically?

3.3 Risk of general soiling: high/average/low

3.3a Risk of water spillage: high/average/low

Colorfastness

Section II

4.0 Duration of maximum direct exposure to sun in hours

4.1 Atmospheric conditions (ozone, gases, etc.)

4.2 Risk of chemical spillage: high/average/low

Static Control

Section II

5.0 Average relative humidity

5.1 Electronic equipment usage

5.2 Presence of excessive oxygen

Acoustical Properties

Section II

6.0 Sound control critical

6.1 Noise reduction coefficient requirements

Tuft Bind

Section II

7.1 Ravelling possibilities

7.1 Tuft bind requirements

Aesthetics

Section II

8.1 Dye or color technique required

8.2 Design or pattern requirements

Construction Characteristics

Section III

9.0 Pile yarn

9.1 Method: Tufted/woven/knitted/fusion bonded

9.2 Backing Materials: Primary Secondary

Specification

Section IV

10.0 Traffic Class: L/M Heavy

10.1 Face Weight

10.2 Pile Height

10.3 Density

10.4 Weight Density

10.5 Gauge or pitch

10.6 Stitches or rows/inch

Installation

Section IV

10.7 Direct glue-down

10.8 Tackless strip

Maintenance

Section IV

10.9 Equipment and schedule

For additional Space Analysis work sheets write:
Monsanto Textiles Company
320 Interstate North Parkway
Atlanta, Georgia 30339 (404) 434-4949

A Monsanto representative will be happy to review your completed work sheet and make fabric recommendations based on your specifications. If you desire such assistance, submit work sheets to the above address, attention: Contract Department.

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We believe this information to be the best currently available on the topic. It is subject to revision as additional knowledge and experience are gained. This information was obtained in Monsanto controlled conditions of laboratory or test facilities or from other sources. Monsanto cannot, however, under any circumstances make any guarantee of results or assume any obligation or liability in connection with the use of this information. Nothing contained herein shall be construed to imply the non-existence of any relevant patents nor to constitute permission, inducement or recommendation to utilize any invention covered by any patent owned by Monsanto or others without consent from the patent owners.